

REMARKS

Initially, in the Office Action dated August 24, 2004, the Examiner objects to the drawings. Claim 4 is rejected under 35 U.S.C. §112, second paragraph. Claims 2 and 6 have been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,517,619 (Muramatsu et al.). Claims 1, 3, 8 and 9 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Muramatsu et al. in view of U.S. Patent No. 5,323,386 (Wiher et al.). The Examiner objects to claims 5 and 7 as being dependent on a rejected base claim, but indicates that claims 5 and 7 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

By the present response, Applicants have amended claims 1-4, 6, 8 and 9 to further clarify the invention. Claims 1-9 remain pending in the present application.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 5 and 7 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Drawing Objections

The Examiner has objected to the drawings. Applicants have amended the drawings consistent with the Examiner's suggestions and respectfully request that these objections be withdrawn.

35 U.S.C. §112 Rejections

Claim 4 has been rejected under 35 U.S.C. §112, second paragraph.

Applicants have amended the claims to further clarify the invention and respectfully request that this rejection be withdrawn.

35 U.S.C. §102 Rejections

Claims 2 and 6 have been rejected under 35 U.S.C. §102(b) as being anticipated by Muramatsu et al. Applicants respectfully traverse these rejections.

Muramatsu et al. discloses providing a system configuration having an interconnection network free from the difficulties occurring in the current systems, which connects processor elements with high connection capability (i.e., with a small number of changeover stages) close to that of the capability of a full crossbar switch when the (technical and financial) upper limit of the amount of hardware and the number of processor elements are arbitrarily given and which gives optimum connection with respect to the communication performance and the amount of hardware; and in particular to provide a technique for variably providing a network having the minimum or optimum amount of switch hardware.

Regarding claims 2 and 6, Applicants submit that Muramatsu et al. does not disclose or suggest the limitations in the combination of each of these claims of, inter alia, a multidimensional crossbar network where a plurality of processor nodes are divided into a plurality of groups and connected, group-by-group, to a plurality of x-axis crossbar switches of distributor exchanger type, and that includes a switching device that performs interface conversion for performing packet communication by a

light signal with any of the crossbar switches or that includes switching LSIs that perform interface conversion for performing packet communication by a light signal with any of the crossbar switches. In the Examiner's §103 rejections in the Office Action, the Examiner admits that Muramatsu et al. does not disclose or suggest these limitations in the claims of the present application.

Accordingly, Applicants submit that Muramatsu et al. does not disclose or suggest the limitations in the combination of each of claims 2 and 6 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

35 U.S.C. 103 Rejections

Claims 1, 3, 8 and 9 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Muramatsu et al. in view of Wiher et al. Applicants respectfully traverse these rejections.

Wiher et al. discloses a switching system comprised of input, intermediate and output switch matrices. There are $r \times m$ input matrices, $r \times m$ output matrices with $m \times r$ intermediate switching matrices. Signals are switched from inputs at the input matrices through the intermediate switch matrices and are output through the output matrices.

Regarding claims 1, 8 and 9, Applicants submit that none of the cited references, taken alone or in any proper combination, disclose, suggest or render obvious the limitations in the combination of each of these claims of, inter alia, a multidimensional crossbar network, or a multidimensional parallel computer, where a

plurality of processor nodes are divided into a plurality of groups and connected, group-by-group, to a plurality of x-axis crossbar switches of distributor exchanger type, and that includes a switching device that performs interface conversion for performing packet communication by a light signal with any of the crossbar switches, or that includes switching LSIs that perform interface conversion for performing packet communication by a light signal with any of the crossbar switches. The Examiner admits that Muramatsu et al. does not disclose or suggest an application involving an interface for performing packet communication by a light signal with any of the crossbar switches, but asserts that Wiher et al. discloses these limitations at Fig. 9, col. 5, line 52 – col. 6, line 56. However, these portions of Wiher et al. merely disclose, as the Examiner has noted, that all external high speed interconnects can be made over fiber optic cables that go to the input and output switches. These portions of Wiher et al. also disclose the advantages of Wiher et al. due to: the switch being symmetric and possessing redundancy, the smaller amount of required cross point switches, that all input and output path delays are equal regardless of the path taken because the signals always pass through five switches, and that the switch is symmetric and constructed using multiples of basic switch blocks. However, this is not a switching device or a switching LSI performing interface conversion for performing packet communication by a light signal with any of the crossbar signals, as recited in the claims of the present application. These portions of Wiher et al. merely disclose that high speed interconnects can be made over fiber optic cables. Wiher et al. does not disclose or suggest anything related to

performing interface conversion for performing packet communication by a light signal with any of the crossbar switches, as recited in the claims of the present application. Wiher et al. does not disclose or suggest anything related to interface conversion. As a matter of fact, Wiher et al. teaches against these limitations in the claims of the present application in that Wiher et al. discloses the advantage of uniformity, and symmetry, and that all external high speed connections can be made over fiber optic cables. Performing interface conversion as recited in the claims of the present application would take away the advantages disclosed in Wiher et al. of the use of symmetry, redundancy, less expensive switch to build and maintain, etc.

Regarding claim 3, Applicants submit that this claim is dependent on independent claim 2 and, therefore, is patentable at least for the same reasons noted previously regarding this independent claim. For example, Applicants submit that none of the cited references disclose or suggest a multidimensional crossbar network that includes a first input/output port for communicating packets, a second input/output port for communicating packets, a third input/output port for communicating packets, and interface conversion means for performing interface conversion of a transmission and reception packet between the first and second input/output port and the third input/output port, where a part of a packet transmission path between the Y-axis crossbar switch and the Z-axis crossbar switch is made by an optical fiber coupled to the optical module.

Accordingly, Applicants submit that none of the cited references, taken alone or in any proper combination, disclose, suggest or render obvious the limitations in

the combination of each of claims 1, 3, 8 and 9 of the present application. Applicants respectfully request that these rejections be withdrawn and that these claims be allowed.

In view of the foregoing amendments and remarks, Applicants submit that claims 1-9 are now in condition for allowance. Early allowance of such claims is respectfully requested.

To the extent necessary, Applicants petition for an extension of time under 37 CFR 1.136. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of Mattingly, Stanger & Malur, P.C., Deposit Account No. 50-1417 (referencing attorney docket no. 520.39527X00).

Respectfully submitted,

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Attachment: Replacement Sheets

Amendments to the Drawings

The attached sheets of drawings includes changes to Figs. 3 and 11. In Figs 3 and 11, errors are corrected as the Examiner requested.